

REMARKS/ARGUMENTS

Reconsideration is respectfully requested of the Official Action of September 3, 2004, relating to the above-identified application.

A one-month extension of time, together with the associated fee, is filed herewith.

Claims 21 to 38 have been amended to refer to the fact that the nanocomposite materials are photoluminescent in the red visible light region and/or in the infrared region. Basis for this amendment is found in the specification, *inter alia*, pg. 4, lines 7-12, 14-18; pg. 7, beginning at line 30 to pg. 8, lines 1-31, as well as in Figures 1 and 2.

New Claims 39-47 have been presented in order to make certain that all aspects of the applicants' invention is adequately claimed. The claims are described in the specification in the same locations as mentioned above.

The rejections of Claims 21-38 under 35 U.S.C. § 102(b) or alternatively, under 35 U.S.C. § 103(a), is traversed and reconsideration is respectfully requested. The Examiner relies on *Fujita (Applied Physics Letters*, vol. 74, no. 2, 1999, pgs. 308-310) and *Mutti (Applied Physics Letters*, vol. 66, no. 7, 1995, pgs. 851-853). These two rejections will be discussed together.

The present invention relates to nanocomposite materials that are photoluminescent at ambient temperatures in the visible red or infrared regions. Nanocomposite materials are featured by containing at least one material the crystals of which have dimensions in the range of nanometers.

The application, on pg. 1, beginning at line 11, explains the background of the material of photoluminescence in silicon, as well as reviews the background concerning nanocomposite

materials. It is explained that nanocomposite photoluminescent materials have potential application as light sources, as well as for use in electronic devices.

State of the art is discussed on pg. 2 of the application, including references to several articles from the *Journal of Applied Physics*, including the article of *Mutti*. Neither *Fujita* nor *Mutti* anticipate nor render *prima facie* obviousness the subject matter of Claims 21-47 in the application.

More particularly, *Fujita* discloses a material of silicon ions implanted in silica which is photoluminescent at ambient temperature. However, the material is strongly electroluminescent in another light region; namely, orange light region and only weakly photoluminescent in visible light regions. The material is not photoluminescent in the infrared region as is the claimed nanocomposite material. Furthermore, *Fujita*'s material does not show infrared absorbance property as does the nanocomposite material defined by Claims 21-47. Subsequently, it is clear that *Fujita* does not anticipate the subject matter of the claims in the present application. Moreover, there is no reason, motivation or suggestion in *Fujita* whereby a person skilled in the art would carry out the defined process as defined in Claims 21-38, nor would it suggest or motivate a person skilled in the art to arrive at the product having the photoluminescence in the infrared region at ambient temperature and having infrared absorbance. Consequently, neither the product by process claims nor the new product claims defined by Claims 39-47 are anticipated or rendered obvious by the *Fujita* publication.

Mutti, defined in the application on pg. 2 as among the most relevant prior art, discloses a prior art of silicon implanted silica layer which is photoluminescent at ambient temperature. The material is photoluminescent in the blue light region. Although the material is photoluminescent

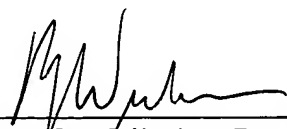
in the red light region, that only occurs if the material is treated at higher than 1000° C. The material is not photoluminescent in the infrared region as is the nanocomposite material defined by the present claims. Moreover, the material does not show infrared absorbance as does the claimed nanocomposite material. Consequently, *Mutti* does not describe the claimed subject matter within the meaning of 35 U.S.C. § 102. Neither are there any suggestions, reasons or motivation in *Mutti* whereby a person skilled in the art would arrive at the process of producing the product or the product itself as defined in the present claims. Nothing would lead a person having ordinary skill in the art to modify the *Mutti* substances so as to have photoluminescence in the red light region or to create a material having photoluminescence in the infrared region at ambient temperature and having infrared absorbance.

For the reasons set forth above, applicants respectfully submit that the rejections are not proper and should be withdrawn.

Favorable action at the Examiner's earliest convenience is respectfully requested.

Respectfully submitted,

SMITH, GAMBRELL & RUSSELL, LLP

By: 
Robert G. Weilacher, Reg. No. 20,531

Suite 3100, Promenade II
1230 Peachtree Street, N.E.
Atlanta, Georgia 30309-3592
Telephone: (404) 815-3593
Facsimile: (404) 685-6893

LIT\833957.1